0045

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

December 20, 2006

TO: Internal File

THRU: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Priscilla Burton, CPSSc, Environmental Scientist III

RE: Amendment to Add Soil Sampling Analysis, PacifiCorp, Deer Creek Mine, C/015/0018, Task ID # 2590

SUMMARY:

In Volume 2, Section R645-301-233, the Permittee commits to a soils sampling program. These samples were taken in October of 2002. The areas to be sampled were identified as accessible sites between 9+00 - 15+00 and 24+00 - 30+00 shown on map DS-1782-D (Appendix R645-301-200-A). These analyses are being included in the MRP with this submittal.

Soil sample locations are shown on Dwg. DS1810D. Laboratory analysis sheets from Inter-Mountain Laboratories (Sheridan) were included. A brief description of the trench or air drilling techniques was provided, but no field notes or depths were provided with the samples.

Two reasons for the sampling program are described: (1) to find suitable substitute topsoil material for the site and (2) to find suitable cover material for the refuse. Previous 2001 sampling indicated that the refuse will require four feet of cover.

The available information indicates that that one out of three proposed substitute soil locations along the Deer Creek drainage is suitable. Depth information and field notes would greatly improve our understanding of the available substitute soil in the canyon.

TECHNICAL ANALYSIS:

OPERATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR 817.22; R645-301-230.

Analysis:

Exploration/Sampling Program - Substitute Topsoil

The Deer Creek Mine was developed prior to enactment of the Surface Mining Control and Reclamation Act (SMRCA), and topsoil was not salvaged or stockpiled during construction and mine development activities. The applicant intends to use construction fills within the disturbance area as substitute topsoil. Much of this fill material came from the terraced area on the south side of Deer Creek Canyon.

To evaluate the fill and refuse quality, a commitment was included in the MRP, Volume 2, Section R645-301-233, for a soils sampling program. The areas to be sampled were identified as accessible sites between 9+00 - 15+00 and 24+00 - 30+00 shown on map DS-1782-D (Appendix R645-301-200-A). These samples were taken in October 2002. These analyses are being included in the MRP with this submittal.

The available information indicates that 2002, sample site 11 represents the only proposed substitute topsoil location that is suitable. The unsuitable substitute topsoil locations are unsuitable due the salt content (EC & SAR values) or the boron content (site 12, EC, SAR values and sites 3 and 4, EC, SAR and Boron values). Depth information and field notes would greatly improve our understanding of the available substitute soil in the canyon.

Fill materials, which have been seeded for 15 to 20 years, may be a source of cover material to be used a cover over the site (pg 5-7). October 2002 sample sites 5, 6, and 7 were located in the operations pad area. They have elevated SAR values, however, these values are 10 times less than the soils in the drainage downstream of the operations pad at sites 3 and 4.

Exploration/Sampling Program - Refuse Piles

Based upon core sampling of the Deer Creek Canyon and Elk Canyon refuse piles conducted in 2001 (Appendix R645-301-200-A), the Division previously determined (TA-99C-rev.doc) that the refuse will require four feet of cover based upon Selenium, SAR and alkaline pH values of the refuse.

Sampling to determine the extent of the sodic material and to, hopefully, discover substitute topsoil at depth in the fill was conducted in 2002 (R645-301-200 Appendix A). MRP Vol. 2, Section R645-301-233 indicates that sample points were to be placed randomly in the refuse areas, and samples would taken at three-foot depth intervals to a point four feet below the grade of the proposed final surface configuration. The 2002 samples were air drilled. Depth intervals were not provided.

The October 2002 samples were drawn from two locations in Elk Canyon at two depths (not disclosed). These samples did not have elevated selenium or boron or extreme SAR values.

October 2002 samples 5 and 6 were on the Deer Creek refuse pile. Site 5 was sampled three times and site 6 was sampled at 8 depths (depths not disclosed). The information provided indicates that although SAR values are elevated in the refuse, the SAR value does not become extreme until greater depth. Depths of the samples were not disclosed.

Findings:

Information provided in the proposal is not adequate to meet the requirements of Operation Plan, Topsoil and Subsoil section of the Regulations. MRP Vol. 2, Section R645-301-233 indicates that sample points were to be placed randomly in the refuse areas, and samples would taken at three-foot depth intervals to a point four feet below the grade of the proposed final surface configuration.

R645-301-233, Provide depth information and field notes associated with all sample locations.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR 817.22; R645-301-240.

Analysis:

Redistribution

Reclamation will involve three disturbed areas: Deer Creek Canyon, Deer Canyon, and Elk Canyon. According to the backfilling and grading plan in Section R645-301-553 of the application, reclamation will begin at the uppermost parts of the disturbed areas and will proceed down the canyons. Various stages of the process will be occurring simultaneously. Substitute topsoil will be excavated from the existing undisturbed drainage corridor. Substitute topsoil will be placed as shown on drawing DS-1816-D in Appendix R645-301-500C.

Maps DS1783D Sheets 1 and 2 illustrate substitute topsoil excavation along the length of the Deer Creek drainage. The locations of these cross sections are shown on map DS-1782-D. A statement on page 5-6 indicates that substitute topsoil will be taken from between stations 9+00 to 15+00 and 24+00 to 31+00. It is estimated 58,891.08 cubic yards of material can be obtained to provide an average cover depth of 27 inches over 16 acres as illustrated on Map DS-

1816-D. Sampling conducted in 2002 suggests that the material in the drainage between stations 7+00 to 13+00 and from 27+00 to 31+00 is unsuitable due to EC and SAR and Boron values (R645-301-200 Appendix A). Depth information and field notes would greatly improve our understanding of the available substitute soil in the canyon.

The fill slopes at the equipment yard and run of mine conveyor which were seeded twenty years ago will be used as substitute topsoil over less desirable soils (high SAR) in the material storage yard (pg 5-7). The procedure will be as follows:

1. Push the top seven feet of pad soils towards the cut slope.
2. Utilize remaining soils to complete the 2:1 slope and cover the salt-laden soils.

Substitute topsoil for the water tank and fan pad will come from the top layer of the berm and outslope of the pad (Section R645-301-500, page 5-7). Sample site 12 indicates that soils along the road to this site may be unsuitable as substitute topsoil due to elevated SAR values. The plan indicates that during reclamation, soils will be contemporaneously sampled for pH and SAR to ensure that the final graded surface is suitable (MRP, Section R645-301-233).

Soil Nutrients and Amendments

The biology chapter of the application says fertilizer will be applied at the rate of 40 pounds per acre of ammonium nitrate and 35 pounds per acre of triple superphosphate. The Division encourages operators to use minimal amounts of fertilizer, and these quantities are relatively low.

In addition to the fertilizer, the applicant commits to apply one ton per acre of certified noxious weed free hay, and the hay and fertilizer will be incorporated into the soil in the gouging process. This should help to increase the amount of organic matter and the fertility and structure of the substitute topsoil.

Refuse Pile Reclamation

Refuse that is cut during grading will be used as fill along cut banks and highwalls. Any acid-forming or toxic [sodic] materials will be covered with four feet of non-acid and/or nontoxic material (pp 2-3, 5-9 and 5-10 of the submittal). October 2002 sample sites 1 and 2 were located in Elk Canyon refuse. No depths were associated with these samples. But only two analyses were run for each location.

October 2002 samples 5 and 6 were on the Deer Creek refuse pile. Site 5 was sampled three times and site 6 was sampled at 8 depths (depths not disclosed). The information provided indicates that although SAR values are elevated in the refuse, the SAR value does not become extreme until greater depth. Depths of the samples was not disclosed.

Findings:

Information provided in the proposal is not adequate to meet the requirements of Reclamation Plan, Topsoil and Subsoil section of the Regulations.

R645-301-233, Further sampling is required to establish the value of substitute topsoil from the drainage at stations 9+00 to 15+00 and 24+00 to 31+00.

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